STUDY OF NONLINEAR STATIC PUSHOVER ANALYSES DUE TO LATERAL LOAD PATTERNS

Final Project

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Faculty of Engineering

Department of Civil Engineering

International S1 Program

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APPROVAL

Final Project

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has been approved

Yogyakarta, July 27, 2012

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PREFACE

First and foremost, the author would like to thank God for His blessing so that the author could prepare and finish the final project report. This report was arranged to finish the S1 degree at Faculty of Engineering, Department of Civil Engineering, Atma Jaya Yogyakarta University.

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The author realizes that there are still limitations and flaws in this final project report. However the author hopes that this final project report might be useful for the readers and the author herself.

Yogyakarta, July 2012

Rosalia Widyaningsih

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ABSTRACT

STUDY OF NONLINEAR STATIC PUSHOVER ANALYSES DUE TO LATERAL LOAD PATTERNS, Rosalia Widyaningsih, Student Number 061312590, 2012, Structure, International Civil Engineering, Department of Civil Engineering, Atma Jaya Yogyakarta University.

Nonlinear Static Pushover Analysis is one of several methods for seismic performance evaluation of structures. It can evaluate the strength of the structure until its performance level. It can also provide reasonable estimates of the location of the plastic hinge of the members. The performance point of structure in Nonlinear Static Pushover Analysis depends on the lateral load pattern applied on the structure. In this study, a 6 story regular building is subjected to two lateral load patterns recommended by FEMA 273. The first lateral load pattern is uniform distribution and the second is equivalent lateral force distribution. The result of the analysis shows that both applied lateral load patterns give the performance of building located between IO-LS level. For both applied lateral load patterns show the similar plastic hinge order, starts from beam end and continues to beam end of the higher story. For both lateral load patterns, the plastic hinge limited to D-E level. In general, the two lateral load patterns give the close result. The structure is safe for both applied lateral load patterns. The target displacement or maximum displacement of the building is 0.08 m. The maximum base shear of the building due to EX is 6432.0498 kN at 0.0629 m. The maximum base shear of the building due to EY is 8252.8213 kN at 0.1874 m.

Keywords: Nonlinear Static Pushover Analysis, uniform distribution, equivalent lateral force distribution, performance point, target displacement